



1-1-1924

Exploration in the Great Tuolumne Canon.

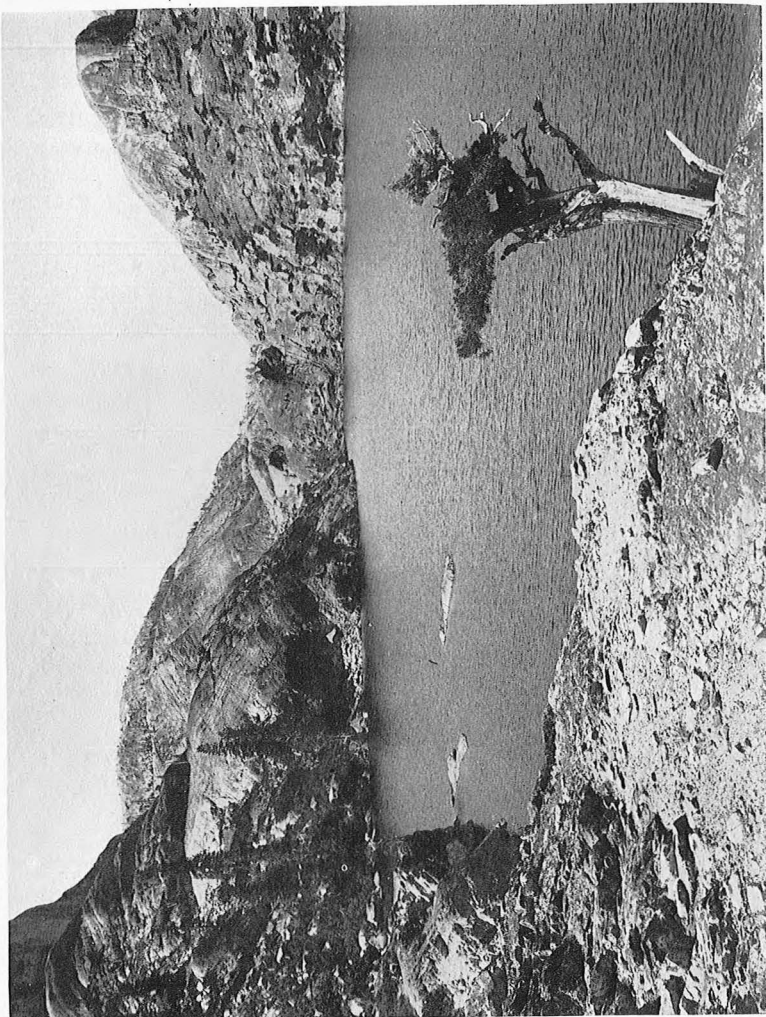
John Muir

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BENSON LAKE
Photograph by Erwin E. Richter

EXPLORATIONS IN THE GREAT TUOLUMNE CAÑON*

BY JOHN MUIR



THE rivers of the Sierra Nevada are very young. They are only children, leaping and chafing down channels in which as yet they scarcely feel at home. . . .

In September, 1871, I began a careful exploration of all the mountain basins whose waters pass through the Yosemite Valley, where I had remained winter and summer for two years. I did not go to them for a Saturday, or a Sunday, or a stingy week, but with unmeasured time, and independent of companions or scientific associations. As I climbed out of Yosemite to begin my glorious toil, I gloated over the numberless streams I would have to follow to their hidden sources in wild, untrodden cañons, over the unnumbered and nameless mountains I would have to climb and account for—over the glacial rivers whose history I would have to trace, in hieroglyphics of sculptured rocks, forests, lakes, and meadows.

This was my "method of study": I drifted about from rock to rock, from stream to stream, from grove to grove. Where night found me, there I camped. When I discovered a new plant, I sat down beside it for a minute or a day, to make its acquaintance and hear what it had to tell. When I came to moraines, or ice-scratches upon the rocks, I traced them back, learning what I could of the glacier that made them. I asked the boulders I met, whence they came and whither they are going. I followed to their fountains the traces of the various soils upon which forests and meadows are planted; and when I discovered a mountain or rock of marked form and structure, I climbed about it, comparing it with its neighbors, marking its relations to living or dead glaciers, streams of water, avalanches of snow, etc., in seeking to account for its existence and character. It is astonishing how high and far we can climb in mountains that we love. Weary at times, with only the birds and squirrels to compare notes with, I rested beneath the spicy pines among the needles and burs, or upon the plushy sod of a glacier meadow, touching my cheek to its enameling gentians and daisies, in order to absorb their magnetism

* Excerpts from an article in the *Overland Monthly*, August, 1873, vol. xi, p. 139.

or mountainism. No evil consequence from "waste of time," concerning which good people who accomplish nothing make such a sermonizing, has, thus far, befallen me.

... I began to guess that I was near the rim of the Great Tuolumne Cañon. I looked back at the wild headlands, and down at the ten lakes, and northward among the gaps, veering for some minutes like a confused compass-needle. When I settled to a steady course, it was to follow a ridge-top that extends from near the edge of the lake-bowl* in a direction a little east of north, and to find it terminating suddenly in a sheer front over 4000 feet in depth.†

This stupendous precipice forms a portion of the south wall of the Great Tuolumne Cañon, about half-way between the head and foot. Until I had reached this brink, I could obtain only narrow strips and wedges of landscape through gaps in the trees; but now the view was bounded only by the sky. Never had I beheld a nobler atlas of mountains. A thousand pictures composed that one mountain countenance, glowing with the Holy Spirit of Light! I crept along on the rugged edge of the wall until I found a place where I could sit down to absorb the glorious landscape in safety. The Tuolumne River shimmered and spangled below, showing two or three miles of its length, curving past sheer precipices and meandering through groves and small oval meadows. Its voice I distinctly heard, giving no tidings of heavy falls; but cascade tones, and those of foaming rapids, were in it, fused into harmony as smooth as the wind-music of the pines.

The opposite wall of the cañon, mainly made up of the ends of ridges shorn off abruptly by the great Tuolumne glacier that once flowed past them, presents a series of elaborately sculptured precipices, like those of Yosemite Valley. Yet, sublime as is the scenery of this magnificent cañon, it offers no violent contrasts to the rest of the landscape; for the mountains beyond rise gradually higher in corresponding grandeur, and tributary cañons come in from the ice fountains of the summits, that are every way worthy of the trunk cañon. Many a spiry peak rises in sharp relief against the sky; in front are domes innumerable, and broad, whale-backed ridges, darkly fringed about their bases with pines, through openings in which I could here and there discern the green of meadows and the flashes of bright eye lakes. There was no stretching away of any part of this

* Ten Lake Basin.

† Probably Grand Mountain.

divine landscape into dimness, nor possible division of it into back, and middle, and foreground. All its mountains appeared equally near, like the features of one face, on which the sun was gazing kindly, ripening and mellowing it like autumn fruit.

The forces that shaped the mountains—grinding out cañons and lake basins, sharpening peaks and crests, digging out domes from the inclosing rocks—carving their plain flanks into their present glorious forms, may be seen at their work at many points in the high Sierra. From where I was seated, sphinx-like, on the brink of the mighty wall, I had extensive views of the channels of five immense tributary glaciers that came in from the summits toward the northeast. Everyone of these five ice rivers had been sufficiently powerful to thrust their heads down into the very bottom of the main Tuolumne glacier. I could also trace portions of the courses of smaller tributaries, whose cañons terminated a thousand feet above the bottom of the trunk cañon. So fully are the lives of these vanished glaciers recorded upon the clean, unblurred pages of the mountains, that it is difficult to assure ourselves that we do not actually see them, and feel their icy breath. As I gazed, notwithstanding the kindly sunshine, the waving of grass, and the humming of flies, the stupendous cañon at my feet filled again with creeping ice, winding in sublime curves around massive mountain brows; its white surface sprinkled with many a gray boulder, and traversed with many a yawning *crevasse*. The wide basins of summits were heaped with fountain snow, glowing white in the thin sunshine, or blue in the shadows cast from black, spiry peaks.

The last days of this glacial winter are not yet past, so young is our world. I used to envy the father of our race, dwelling as he did in contact with the new-made fields and plants of Eden; but I do so no more, because I have discovered that I also live in creation's dawn; the morning stars still sing together, and the world, not yet half-made, becomes more beautiful every day.

By the time the glaciers were melted from my mind, the sun was nearing the horizon. Looking once more at the Tuolumne glistening far beneath, I was seized with an invincible determination to descend the cañon wall to the bottom. Unable to discover any way that I cared to try, from where I stood, I ran back along the ridge by which I approached the valley, then westward about a mile, and clambered out upon another point that stood boldly forward into the cañon.

From here I had a commanding view of a small side-cañon on my left, running down at a steep angle; which I judged, from the character of the opposite wall, might possibly be practicable all the way. Then I hastened back among the latest sun-shadows to my camp in the spruce trees, resolved to make an attempt to penetrate the heart of the Great Cañon next day. I awoke early, breakfasted, and waited for the dawn. The thin air was frosty, but, knowing that I would be warm in climbing, I tightened my belt, and set out in my shirt-sleeves, limb-loose as a pugilist. By the time I reached the mouth of the narrow cañon-way I had chosen, the sun had touched all the peaks with beamless light. I was exhilarated by the pure, divine wildness that imbued mountain and sky, and I could not help shouting as I dashed down the topmost curves of the cañon, there covered with a dense plush of *carex*, easy and pleasant to tread.

After accomplishing a descent of four or five hundred feet, I came to a small mirror-lake set here on the slanting face of the cañon upon a kind of shelf. This side-cañon was formed by a small glacier, tributary to the main Tuolumne glacier, which, in its descent, met here with a very hard seamless bar of granite, that extended across its course, compelling it to rise, while the softer granite in front of it was eroded and carried away, thus forming a basin for the waters of the cañon stream. The bar or dam is beautifully molded and polished, giving evidence of tremendous pressure. Below the lake, both the sides and bottom of the cañon became rougher and I was compelled to scramble down and around a large number of small precipices, fifty or a hundred feet high, that crossed the cañon, one above another, like gigantic stairs.

Below the foot of the stairs are extensive willow tangles, growing upon rough slopes of sharp-angled rocks, through which the stream mumbles and gropes its way, most of the time out of sight. These tangles are too dense to walk *among*, even if they grew upon a smooth bottom, and too tall and flexible to walk *upon*. Crinkled and loosely felted as they are by the pressure of deep snow for half the year, they form more impenetrable jungles than I ever encountered in the swamps of Florida. In descending, one may possibly tumble and crush over them in some way, but to ascend them, with their longer branches presented against you like bayonets, is very nearly impossible. In the midst of these tangles, and along their margins, small garden-like meadows occur where the stream has been able to

make a level deposit of soil. They are planted with luxuriant *carices*, whose long, arching leaves wholly cover the ground. Out of these rise splendid larkspurs six to eight feet high, columbines, lilies, and a few polygonums and erigerons. In these moist garden-patches, so thoroughly hidden, the bears like to wallow like hogs. I found many places that morning where the bent and squeezed sedges showed that I had disturbed them, and knew I was likely at any moment to come upon a cross mother with her cubs. Below the region of bear-gardens and willow tangles, the cañon becomes narrow and smooth, the smoothness being due to the action of snow avalanches that sweep down from the mountains above and pour through this steep and narrow portion like torrents of water. I had now accomplished a descent of nearly 2,500 feet from the top, and there remained about 2,000 feet to be accomplished before I reached the river. As I descended this smooth portion, I found that its bottom became more and more steeply inclined, and I halted to scan it closely, hoping to discover some way of avoiding it altogether, by passing around on either of the sides. But this I quickly decided to be impossible, the sides being apparently as bare and seamless as the bottom. I then began to creep down the smooth incline, depending mostly upon my hands, wetting them with my tongue and striking them flatly upon the rock to make them stick by atmospheric pressure. In this way I very nearly reached a point where a seam comes down to the bottom in an easy slope, which would enable me to escape to a portion of the main wall that I knew must be climbable from the number of live-oak bushes growing upon it. But after cautiously measuring the steepness—scrutinizing it again and again, and trying my wet hands upon it—both mind and limbs declared it unsafe, for the least slip would insure a tumble of hundreds of feet. I was, therefore, compelled to retrace my devious slides and leaps up the cañon, making a vertical rise of about 500 feet, in order that I might reach a point where I could climb out to the main cañon-wall, my only hope of reaching the bottom that day being by picking my way down its face. I knew from my observations of the previous day that this portion of the cañon was crossed by well-developed planes of cleavage, that prevented the formation of smooth vertical precipices of more than a few hundred feet in height, and the same in width. These may usually be passed without much difficulty. After two or three hours more of hard scrambling, I at length stood among cool shadows on the river-

bank, in the heart of the great unexplored cañon, having made a descent of about 4,500 feet, the bottom of this portion of the cañon above the level of the sea being quite 4,600 feet. The cañon is here fully 200 yards wide (about twice the size of the Merced at Yosemite), and timbered richly with libocedrus and pine. A beautiful reach stretches away from where I sat resting, its border-trees leaning toward each other, making a long arched lane, down which the joyous waters sung in foaming rapids. Stepping out of the river grove to a small sandy flat, I obtained a general view of the cañon-walls, rising to a height of from 4,000 to 5,000 feet, composed of rocks of every form of which Yosemite are made. About a mile up the cañon, on the south side, there is a most imposing rock, nearly related in form to the Yosemite Half Dome. The side-cañon by which I descended looked like an insignificant notch or groove in the main wall, though not less than 700 or 800 feet deep in most places. It is one of the many small glacier-cañons that are always found upon the south sides of trunk cañons when they have a direction approaching east and west.

The continuity of the north walls of such trunk cañons is also broken by side-cañons, but those of the north side are usually much larger, and have a more steady and determined direction, being related to cañons that reach back to high glacier-fountains; while many of those of the south side may be strictly local. The history of their formation is easily read: they were eroded by the action of small, lingering glaciers that dwelt in the shade of the walls, long years after the exposed sun-beaten north walls were dry and bare. These little south-side cañons are apt to be cut off high above the bottom of the trunk cañon, because the glaciers that made them were swept round and carried away by the main trunk glacier, at heights determined by the respective forces of their currents. This should always be taken into consideration when we are weighing the probabilities of being able to reach the bottom of a trunk cañon by these tributaries.

Immediately opposite the point I descended are "royal arches," like those of Yosemite, formed by the breaking-up and the removal of a portion of a number of the concentric layers of a dome. All of the so-called "royal arches" of this region are produced in the same way.

About a mile farther down the cañon, I came to the mouth of a

tributary* that enters the trunk cañon on the north. Its glacier must have been of immense size, for it eroded its channel down to a level with the bottom of the main cañon. The rocks of both this tributary and of the main cañon present traces of all kinds of ice-action—moraines, polished and striated surfaces, and rocks of special forms. Just at the point where this large tributary enters the trunk cañon, there is a corresponding increase in size and change in direction of the latter. Indeed, after making a few corrections that are obviously required, for planes of cleavage, differences of hardness, etc., in the rocks concerned, the direction, size, and form of any main cañon below a tributary are always resultants of the forces of the glaciers that once occupied them, and this signifies that *glaciers make their own channels*. In front of this great tributary the cañon is about half a mile wide, and nobly gardenized with groves and meadows.† The level and luxuriant groves almost always found at the mouths of large tributaries are very distinct in appearance and history from the strips and patches of forest that adorn the walls of cañons. The soil upon which the former grow is reformed moraine matter, collected, mixed, and spread out in lake-basins by streams. The trees are closely grouped into villages, social and trim; while those of the walls are roughish, and scattered like the settlements of the country. Some of these lake-basin groves are breezy from the way the winds are compelled to tumble and flow, but most are calm at the bottom of pits of air.

I pushed on down the cañon a couple of miles farther, passing over leafy level floors, buried in shady greenwood, and over hot sandy flats covered with the common *pteris*, the sturdiest of ferns, that bears with patience the hot sun of Florida and the heavy snows of the high Sierra. Along the river-bank there are abundance of azaleas and brier-roses growing in thickets. In open spots, there is a profusion of golden *compositæ*. Tall grasses brushed my shoulders, and yet taller lilies and columbines rung their bells above my head. Nor was there any lack of familiar birds and flies, bees and butterflies. Myriads of sunny wings stirred all the air into music. The stellar-jay, garrulous and important, flitted from pine to pine; squirrels were gathering nuts; woodpeckers hammered the dead limbs; water-ouzzels sung divinely on wet boulders among the rapids; and the robin-redbreast of the orchards was everywhere. Here was no

* Probably Piute Creek.

† Pate Valley.

field, nor camp, nor ruinous cabin, nor hacked trees, nor down-trodden flowers, to disenchant the Godful solitude. Neither did I discover here any trace or hint of lawless forces. Among these mighty cliffs and domes there is no word of chaos, or of desolation; every rock is as elaborately and thoughtfully carved and finished as a crystal or shell.

I followed the river three miles. In this distance it makes a vertical descent of about 300 feet, which it accomplishes by rapids. I would fain have lingered here for months, could I have lived with the bears on cherries and berries, and found bedding and blanketing like theirs. I thought of trying their board and lodging for a few days; but at length, as I was in my shirt-sleeves and without food, I began my retreat. Let those who become breathless in ascending a few stairs think of climbing these Yosemite attics to a bed 5,000 feet above the basement. I pushed up the first 3,000 feet almost without stopping to take breath, making only momentary halts to look at striated surfaces, or to watch the varying appearances of peaks and domes as they presented themselves at different points.

As I neared the summit I became very tired, and the last thousand feet seemed long indeed, although I began to rest frequently, turning to see the setting sun feeding the happy rosy mountains. I reached the top of the wall at sunset; then I had only to skim heedlessly along a smooth horizontal mile to camp. I made a fire and cooked my supper, which, with me, means steeping a tincupful of tea, and eating a craggy boulder of bread. How few experience profound mountain weariness and mountain hunger!

No healthy man who delivers himself into the hands of Nature can possibly doubt the doubleness of his life. Soul and body receive separate nourishment and separate exercise, and speedily reach a stage of development wherein each is easily known apart from the other. Living artificially in towns, we are sickly, and never come to know ourselves. Our torpid souls are hopelessly entangled with our torpid bodies, and not only is there a confused mingling of our own souls with our own bodies, but we hardly possess a separate existence from our neighbors.

The life of a mountaineer is favorable to the development of soul-life as well as limb-life, each receiving abundance of exercise and abundance of food. We little suspect the great capacity that our flesh has for knowledge. Oftentimes in climbing cañon-walls I have come

to polished slopes near the heads of precipices that seemed to be too steep to be ventured upon. After scrutinizing them and carefully noting every dint and scratch that might give hope for a foothold, I have decided that they were unsafe. Yet my limbs, possessing a separate sense, would be of a different opinion, after they also had examined the descent, and confidently have set out to cross the condemned slopes against the remonstrances of my other will. My legs sometimes transport me to camp, in the darkness, over cliffs and through bogs and forests that are inaccessible to city legs during the day, even when piloted by the mind which owns them. In like manner the soul sets forth at times upon rambles of its own. Brooding over some vast mountain landscape, or among the spiritual countenances of mountain flowers, our bodies disappear, our mortal coils come off without any shuffling, and we blend into the rest of Nature, utterly blind to the boundaries that measure human quantities into separate individuals. But it is after both the body and soul of a mountaineer have worked hard, and enjoyed much, that they are most palpably separate. Our weary limbs, lying restingly among the pine-needles, make no attempt to follow after or sympathize with the nimble spirit, that, apparently glad of the opportunity, runs off alone down the steep gorges, along the beetling cliffs, or away among the peaks and glaciers of the farthest landscape, or into realms that eye hath not seen, nor ear heard; and when at length we are ready to return home to our other self, we scarcely for a moment know in what direction to seek for it. I have often been unable to make my muscles move at such times. I have ordered my body to rise and go to bed when it seemed to me as if the nerves concerned were cut, and that my soul-telegram had not reached the muscles at all.

Few persons have anything like an adequate conception of the abundance, strength, and tender loveliness of the plants that inhabit these so-called frightful gorges. . . .

This little cañon is a botanical garden, with dwarf arctic-willows not two inches high at one end, bush *compositæ* and wandy half-tropical grasses at the other; the two ends only half a day apart, yet among its miniature bogs, prairies, and heathy moorlands, the botanist may find representatives of as many climates as he would in traveling from Greenland to Florida.

The next morning after my raid in the Tuolumne country, I passed back over the border to Merced, glad that I had seen so much,

and glad that so much was so little of the whole. The grand rocks, I said, of this Tuolumne Yosemite fire books never yet opened; and, after studying the mountains of the Merced Basin, I shall go to them as to a library, where all kinds of rock-structure and rock-formation will be explained, and where I shall yet discover a thousand waterfalls.

THE MOUNTAINEER'S EVENING

PERHAPS there is no element in the varied life of an explorer so full of contemplative pleasure as the frequent and rapid passage he makes between city life and home; by that I mean his true home, where the flames of his bivouac fire light up trunks of sheltering pine and make an island of light in the silent darkness of the primeval forest. The crushing Juggernaut-car of modern life and the smothering struggle of civilization are so far off that the wail of suffering comes not, nor the din and dust of it all. . . . Such is the mountaineer's evening spent contemplatively before his fire; the profound sense of Nature's tranquillity filling his mind with its repose till the flames give way to embers, and guardian pines spread dusky arms over his sleep.

CLARENCE KING

"MOUNTAINEERING IN THE SIERRA NEVADA"

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